1. INTRODUCTION

1.1 PREVIOUS ACTIONS

In this EA, the DOE reports the results of an analysis of the potential environmental impacts from proposed improvements to the Thomas Jefferson National Accelerator Facility (TJNAF or Jefferson Lab) in Newport News, Virginia. See Figure 1 for a vicinity plan, Figure 2 for a site map, and Figure 3 for a site aerial view in Chapter 2. SURA operates Jefferson Lab under contract to DOE.

The main Jefferson Lab accelerator, CEBAF produces an electron beam for experiments in basic nuclear physics, in particular, for the study of quark structures and behaviors and the forces that govern the clustering of nucleons in the atomic nucleus. On January 12, 1987, DOE issued a finding of no significant impact (FONSI) based on an environmental assessment of the proposed construction and operation of CEBAF (DOE 1987). CEBAF construction was completed in early 1995. Commissioning of components paralleled construction activities so that the CEBAF accelerator began operating to serve the DOE physics program in late 1995 and has continued operating to this day.

In the EA (DOE 1987), the proposed action for which impacts were evaluated was the construction and operation of CEBAF to produce an electron beam in the range from 0.5 to 4.0 GeV (giga (billion) electron volts) beam energy with a maximum beam power of 1000 kilowatts (kW). In 1997, in accordance with the National Environmental Policy Act (NEPA) regulations, a new EA, DOE/EA-1204 (DOE 1997), was completed to review environmental and safety impacts of (1) changing the operating parameters of the CEBAF and (2) establishing the operating parameters for the FEL, which was operating in a demonstration mode. On November 5, 1997, DOE issued a FONSI based on this environmental assessment of the proposed changes in CEBAF and the new operating parameters for the FEL. Based on this EA, DOE found that the impacts from this proposed action would exceed those assessed in the 1987 EA and FONSI, but were found to still not be significant. Thus, DOE concluded that no further NEPA review was necessary for the change in operating parameters of the CEBAF including increasing the energy range up to 8.0 GeV at a maximum beam power of 1,000 kW or for the operation of the FEL with 10 kW UV (ultraviolet) or 20 kW IR (infrared) laser beams for experimental use.

1.2 SCOPE OF THIS PROPOSED ACTION

The proposed action evaluated in this EA involves improvements to support the operation of Jefferson Lab. With this proposal, DOE intends to construct no more than four major two or three story additions totaling about 151,000 sq. ft. to CEBAF Center, the main facility administration building, and the addition of three new single story and one two story operations support structures on the accelerator site. The single story structures are a new 28,000 sq. ft. storage building (this square footage includes a mezzanine), a new 15,100 sq. ft. technical support building, and a new 3,500 sq. ft. refrigeration service building. The proposed two-story structure is a 22,600 sq. ft addition to the FEL facility. The FEL Addition will house a new synchrotron light source named Helios. The proposed action also involves the operation of the Helios accelerator.

DOE has prepared this EA to determine the potential for adverse impacts from radiation produced with the operation of the Helios, disturbance of land from construction, effects on the offsite population, and other sources of potential impact.

1.3 PURPOSE OF AND NEED FOR DOE ACTION

DOE proposes to take this action to provide Jefferson Lab with improved staff and operations support facilities that, along with the operation of Helios, will provide an increased capability to facilitate accelerator and physics program operations. The new space will be used to accommodate the growing staff and user community. It will also be used to do a needed expansion to the computer center and would

house the facility library in a more convenient location than presently exists. The existing buildings are utilized to capacity and the use of offsite leased space to meet Lab needs is not as resource efficient or cost effective as having use of DOE owned space. The use of the Helios machine will enable a more diverse range of experiments in support of Jefferson Lab's current mission of providing the nation with physics research opportunities. Using Helios in conjunction with the FEL, both within approved operating levels, will provide even more opportunities in support of Jefferson Lab's mission.

The purpose of the proposed action is to continually improve Jefferson Lab's capability to expand its research capabilities. The proposed improvements to Jefferson Lab will require additional funding. The sources of funding are being explored (DOE, Commonwealth of Virginia, and third party agreements).

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